

[0038] FIG. 14 is a perspective view of an example cryosurgery kit according to an example embodiment of the present invention. The cryosurgery kit may include the container 100, which itself may include the base 140 and the cover 150. The cryosurgery kit may also include the cryogen bottle 160, a plurality of applicator tips 300, the valve actuation assembly 120, the reservoir 130, the door 184, and an information booklet 400. The cryogen bottle 200 is situated in the depression 160 such that the cryogen bottle 200 is tilted back from a vertical position. Applicator tips 300 may be stored in the second depression 180. The door 184 may aid in keeping the applicator tips 300 from inadvertently spilling out of the second depression 180 and may prevent excess dirt, dust, moisture or other foreign material from settling on the applicator tips 300. One applicator tip 300 may also be pre-attached to the hub 220 of the cryogen bottle 200, in order to show proper assembly. The information booklet 400 may be stored in the fourth depression 190. In addition, a card (not shown) including a brand name, picture, diagram or other product information, including treatment instructions and recommendations, may be inserted or mounted in the fourth depression 190.

[0039] The cryosurgery device stored in container 100 may be used, for example, to treat warts, skin tags and other skin lesions. In operation of this device, the cryogen bottle 200 is removed from the frustoconical depression 160 of base 140 and placed in an upright position. An applicator tip 300 is then removed from the second depression 180 in the base 140 and screwed onto the hub 220 of the cryogen bottle 200 via threads 260. The cryogen bottle/applicator tip assembly is then turned upside down and caused to mate with the valve actuation assembly 120. In so doing, the cryogen bottle 200 is rotated until the aligning ribs 250 of the hub 220 are in alignment with, and engage with, the aligning recesses 126 of the valve actuation assembly 120. The arcuate keys 124 of the valve actuation assembly 120 and the slots 240 of the hub 220 are positioned relative to the aligning recesses 126 and the aligning ribs 250, respectively, in such a manner, that the arcuate keys 124 engage with the slots 240 simultaneously to the aligning ribs 250 engaging with the aligning recesses 126. A downward force is then applied by hand to the cryogen bottle 200 for a time period of, for example, approximately 2 to 3 seconds. As mentioned with regard to FIG. 10, the width and depth of the base 140 are substantially greater than the diameter of the valve actuation assembly and the diameter of the cryogen bottle 200, which may allow the base 140 to remain stable and not tip as the downward force is applied to the valve actuation assembly 120. During application of the force, the arcuate keys 124 press down on the annular shoulder of the valve 230, situated directly beneath the slots 240, and actuate the valve 230. As a result, the valve 230 is opened and refrigerant from the cryogen bottle 200 enters the applicator tip 300 and travels through the lower and center sections 320, 330 of the applicator tip 300. When the refrigerant reaches the upper section 340 of the applicator tip 300, the refrigerant is channeled through grooves 370 onto the porous cylindrical tip 350 and into the reservoir 130. As the refrigerant flows onto the cylindrical tip 350, the tip 350 is cooled to a temperature of approximately  $-20^{\circ}\text{C}$ . or less. The force is then removed from the cryogen bottle 200, thereby causing the aerosol valve 230 to close and the flow of refrigerant to cease. The cryogen bottle/applicator tip assembly is then removed from the valve actuation assembly 120, and the

applicator tip 300 is applied to a wart, skin tag or other skin lesion for an appropriate period of time.

[0040] The above-mentioned container 100 having base 140 with depressions for storage and a valve actuation assembly 120 for operation has several advantages. First of all, the parts of the cryosurgery device are stored in one place. In addition, the valve actuation assembly 120 and reservoir 130 are connected to and/or integrated into a stable base 140 that will remain steady even when a non-vertical force component is introduced into the cryogen bottle 200 during actuation of aerosol valve 230. Furthermore, the reservoir 130 ensures that the refrigerant expelled from the cryogen bottle 200 is retained near the porous cylindrical tip 350 of the applicator tip 300, efficiently utilized and not inadvertently spilled.

[0041] In an alternative embodiment of the cryosurgery device, no applicator tip 300 needs to be screwed onto the hub 220 of the cryogen bottle 200. Instead, refrigerant from the cryogen bottle 200 may simply be injected directly into the reservoir, and a swab may be subsequently immersed in a resulting pool of refrigerant in the reservoir 130. In certain embodiments, the swab may be an applicator tip 300 that has not been chilled by refrigerant as described above, but is manually inserted into reservoir disconnected from the cryogen bottle 200. After a prescribed period of time, the swab may be removed from the reservoir and applied to a wart, skin tag or other skin lesion.

[0042] The foregoing description discloses only exemplary embodiments of the invention. Modification of the above-disclosed apparatus which falls within the scope of the invention will be readily apparent to those of ordinary skill in the art. Accordingly, while the present invention has been disclosed in connection with exemplary embodiments thereof, it should be understood that other embodiments may fall within the spirit and scope of the invention, as defined by the following claims.

What is claimed is:

1. A container for a cryosurgery device which includes a cryogen bottle, comprising:
  - a container body including an internal space configured to hold the cryogen bottle; a valve actuation assembly mechanically coupled to the container body, the valve actuation assembly configured to actuate a valve on the cryogen bottle; a reservoir positioned relative to the valve actuation assembly so that the reservoir receives refrigerant from the cryogen bottle when the valve on the cryogen bottle is actuated using the valve actuation assembly.
2. The container of claim 1, wherein the reservoir is situated beneath the valve actuation assembly.
3. The container of claim 1, further comprising:
  - a base, wherein the valve actuation assembly and the reservoir are integral parts of the base; and a cover configured to form a closed volume with the base, the closed volume dimensioned large enough to contain the cryogen bottle.
4. The container of claim 3, wherein a width and a depth of the base are substantially greater than a diameter of the cryogen bottle and a diameter of the valve actuating assembly.
5. The container of claim 3, wherein the base includes a first depression into which the cryogen bottle may be placed.
6. The container of claim 5, wherein the first depression is approximately frustoconical.
7. The container of claim 6, wherein the first depression has an approximately circular bottom and is oriented such that